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Arachnids in three Egyptian coastal protected areas on Aqaba gulf (Red Sea)

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Abstract

This is a preliminary study of four orders of class Arachnida, i.e. Araneida, Pseudoscorpionida, Scorpionida and Solpugida, in three Egyptian protected areas on the Gulf of Aqaba in South Sinai, i.e. Ras Mohammad, Nabq and Abu Galoum Protectorates. Several taxa were identified, including 25 spiders, 1 pseudoscorpion, 3 scorpions and 1 sun-spider, and many were unidentifiable. The spiders of Mangrove plants of these areas are here recorded for the first time. The studied areas need a seasonal survey and more detailed studies.

Key Words: Arachnida, Spiders, Scorpions, Pseudoscorpions, Solpugids, Protected areas, Mangrove, Aqaba Gulf, Red Sea, Sinai, Egypt.

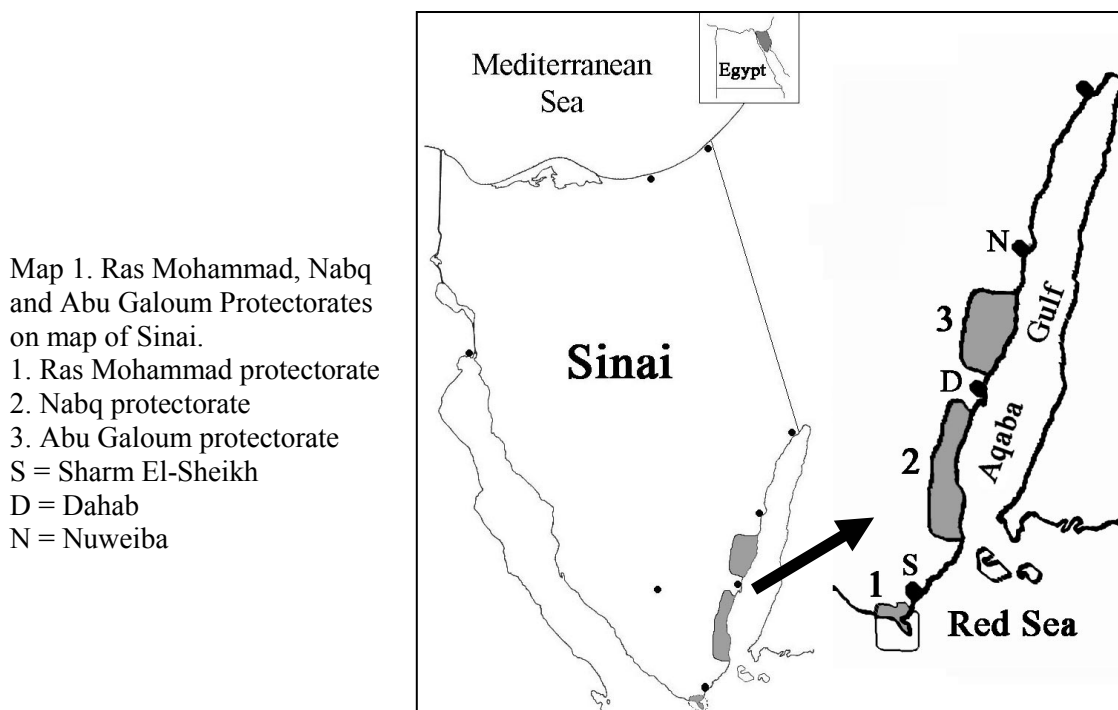
Introduction

Most studies in protected areas in the world are devoted to vertebrate animals. Invertebrate animals are mostly neglected, in spite of their huge number of species/individuals and their great influences on the surrounding habitats. Arachnids, especially spiders, constitute a considerable ratio of invertebrates with great ecological importance. They have a very important role, as predators, in biological balance.

A preliminary study of Arachnida in three protected areas on Aqaba Gulf had been achieved during 1994-1995. It is impossible to find each species living in an area during four limited trips. The recorded species may be the most common species in those areas.

Identification of spiders is very difficult in a poorly studied arachno-fauna as in Egypt. Juvenile specimens are useless and unidentifiable, even to genus level. In few cases, individual juvenile spiders were kept alive until they reached maturity and became identifiable (e.g. *Heriaeus buffoni* female and *Latrodectus pallidus* male).

The brief description of each of the three protectorates is adopted from MSEA (2001) and Rashid (2002).



Methods

A survey of spiders and scorpions had been achieved in three protected areas on Aqaba Gulf (Ras Mohammad, Nabq and Abu Galoum Protectorates) during 1994-1995. (Map 1).

Different sites were selected and surveyed as scattered places in each protectorate. The aim was to discover different areas and habitats and to know what species are existing there. Those sites are mentioned with their longitudes and latitudes in the Results section before the tables of collected spider specimens.

The collecting methods were: 1. Collecting with the hands, 2. Beating net, 3. Sweeping net, 4. Pitfall trapping, 5. Light attracting and 6. Ultra-Violet light collecting for scorpions. The identification of specimens was executed in the light of the available taxonomical knowledge, taking in consideration that the group of Arachnida is poorly studied in this geographical area. Indeed, it is the first study of arachnids in the coastal protected areas of Egypt.

Results

Results are here arranged within smaller sections, each deals with the spiders, scorpions, pseudoscorpions and sun-spiders of one protected area. A list of spider

species, alphabetically arranged, is presented at the end of these smaller sections with authors and dates to avoid mentioning them inside the tables.

A. Ras Mohammad protectorate

Ras Mohammad National Park was declared as protected area by the Prime Ministerial Decree No. 1068 for 1983 adjusted by Prime Ministerial Decree No. 2035 for 1996. Its area is about 480 km² (about 850 km² with Tiran and Sanafir islands). Type: World Heritage Protected Area.

Ras Mohammad is the headland at the southern most tip of the Sinai Peninsula, overlooking the juncture of the Gulfs of Suez and Aqaba. Coral reefs fringe Ras Mohammad from all directions; these include some of the best diving localities in the world. The uniqueness of the site, its diversity of vertebrate and invertebrates species, its coral formations and water clarity all combine to provide a memorable underwater experience. Littoral habitats include a Mangrove *Avicennia marina* community, salt marshes, intertidal flats, as well as, a diversity of shoreline configurations. The Mangrove Channel separates Ras Mohammad Peninsula from El-Baayra Islet at a length of approximately 250m. Beside the park's marine riches, it also contains a considerable diversity of desert habitats such as mountains and wadis, gravel plains and sand dunes. The threatened Dorcas Gazelle *Gazella dorcas* and Nubian Ibex *Capra nubiana* are both known from the park. Ras Mohammad is a bottleneck for migratory soaring birds, which pass through the area in vast numbers and regularly stop to rest and feed. The majority of the world population of White Stork *Ciconia ciconia* pass through the area. The threatened Green Turtle *Chelonia mydas* and Hawksbill Turtle *Eretmochelys imbricata* occur off Ras Mohammad regularly. The islands of Tiran and Sanafir are part of the Ras Mohammad Protected Area. These islands hold important breeding populations of the threatened and endemic White-eyed Gull *Larus leucophthalmus* and Osprey *Pandion haliaetus*. Adjoining sea grass beds are of importance for marine turtles.

Collecting Sites:

1. Mangrove Channel: 27°43'N 34°15'E
2. Water tank region, upon Wadi Khoshbi: 27°48'N 34°13'E
3. Wadi Khoshbi: 27°48'N 34°12'E
4. Wadi El-Kharitah: 27°51'N 34°15'E
5. Laboratories area and Visitors centre
6. Main Beach: 27°43'N 34°14'E

Dates of collecting: 2-3 April, 20-21 July, 20-21 November 1994 & 20-21 May 1995.

I. Order Araneida

Spiders of ten families were collected from five sites (1-5). The identification of the collected specimens with their numbers, months of collecting and sites of collection are included in Table 1 and the percentage of specimens of every spider family is plotted in Fig. 1.

Table 1: Spiders collected from Ras Mohammad protectorate (April 1994–May 1995).

Family	Species	Specimens	Sites	Months
Araneidae	? sp.	3j	1	Nov
Gnaphosidae	<i>Micaria</i> sp.	1♀	2	Apr
	<i>Pterotricha conspersa</i>	5♀, 1s♀, 8j	1,2,3,5	Apr, Jul, Nov
	? sp. (3 spp.)	1♂, 2♀, 3j	2,3	Apr, May, Jul, Nov
Miturgidae	<i>Cheiracanthium</i> sp.	1♀, 3j	2,4	Apr, May
Oecobiidae	<i>Oecobius</i> sp.	1j	2	Apr
	<i>Uroctea limbata</i>	1♀, 1j	3	Jul
Oxyopidae	<i>Peucetia arabica</i>	2♂, 3♀, 1s♂, 4s♀, 11j	1,2,4	Apr, May, Nov
Philodromidae	<i>Philodromus sinaiticus</i>	1♀	1	Apr
	<i>Philodromus</i> sp.	4♀, 29j	1,2,3,4	Apr, May, Jul, Nov
	<i>Thanatus</i> sp.	1♀	2	Apr
Pholcidae	? sp.	1♂, 2♀, 1s♂, 2 j	3,4	May, Jul
Salticidae	<i>Mogrus sinaicus</i>	1♂, 14♀, 1s♀, 8j	2,3,4	Apr, May, Jul
	? sp. (~5 spp.)	3♀, 1s♂, 2s♀, 41j	1,2,4,5	Apr, May, Nov
Thomisidae	<i>Heriaeus buffoni</i>	2s♀, 2j	2	Apr, May, Nov
	<i>Thomisus onustus</i>	35♂, 3♀, 10s♂, 25s♀, 87j	2,3,4	Apr, May, Jul
	<i>Xysticus fesus</i> ?	7♀, 6j	2,4	Apr, May, Nov
Zodariidae	<i>Zodarion</i> sp.	1s♀	3	Apr

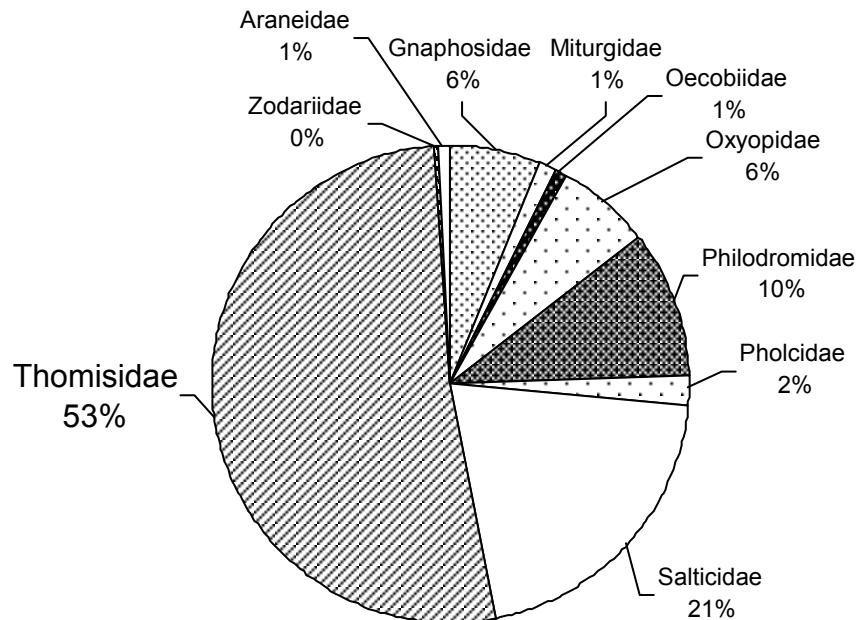


Fig. 1. Percentage of specimens of every spider family collected from Ras Mohammad Protectorate.

Most spiders were found under stones. The other habitats and observations on some spider taxa, arranged alphabetically according to families, are as follows :

ARANEIDAE: on Mangrove plants *Avicennia marina* (Forskål, 1775) in Site 1.

GNAPHOSIDAE: *Micaria*: under stones near ant colonies, Site 2. *Pterotricha conspersa*: females and juveniles were found among mangrove's litter in Site 1. A female of unidentifiable genus was found inside an empty nest of the salticid *Mogrur* on *Leptadenia pyrotechnica* (Forskål, 1775) plant in Site 3.

MITURGIDAE: *Cheiracanthium*: a female in its web with an egg sac, under stone ?!, in Site 2, on April.

OECOBIIDAE: *Uroctea limbata*: on a stony wall, Site 3.

OXYOPIDAE: *Peucetia arabica*: on plants in Sites 1,2,4.

PHILODROMIDAE: *Philodromus sinaiticus* ?: among mangrove's litter in Site 1. *Thanatus* sp.: a female with her egg sac, under stone in Site 2, on April.

PHOLCIDAE: in webs on a rocky wall in Site 3.

SALTICIDAE: among mangrove's litter in Site 1. *Mogrur sinaicus* ?: females inside their nests on *Acacia*, *Leptadenia* and other plants, and a wanderer male, Sites 2,3,4.

THOMISIDAE: *Heriaeus buffoni*: subadult females and juveniles were found under plants and stones in Site 2. One of the subadult females was reared until reaching adulthood and being identifiable to species. *Thomisus onustus*: several males, females and juveniles were found on plants and collected by sweeping net from the summits of herbs in Sites 2,3,4. Sometimes, it was found on taller plants like *Acacia* and *Aerva javanica*. *Xysticus fesus* ?: was found under plants and stones in Sites 2,4.

ZODARIIDAE: *Zodarium* sp.: 1 s♀ was found under a stone in Site 3, on April.

II. Order Pseudoscorpionida

Fifteen specimens, 7♂ + 7♀ + 1j, of Family Olpiidae, *Minniza* cf. *hirsti* J.C. Chamberlin, 1930, were found under stones; 14 in Site 2 (Water tank region, upon Wadi Khoshbi): 13 on April and 1 on July. Only one female specimen was found in Site 4 (Wadi El-Kharitah) on May.

III. Order Scorpionida

Scorpions were only found in Site 2. Three specimens of Family Buthidae, *Leiurus quinquestriatus* (Ehrenberg, 1828), were collected; two of them under stones on May and July and the third was collected on November using Ultra Violet radiation.

IV. Order Solpugida

Two families were recorded from two sites. In Site 2, one specimen of family Daesiidae, genus *Blossiola* ? was found under stone on April. A *Galeodes* ? individual (Family Galeodidae) was seen, but not caught, on July in the same site. In Site 6 (Main Beach), another *Galeodes* sp. was captured when it was running on sand at midday on May.

B. Nabq protectorate

Nabq was declared as protected area by the Prime Ministerial Decree No. 1511 for 1992. Its area is about 600 km². Type: Multipurpose Protected Area.

Nabq is one of the northern-most Mangrove *Avicennia marina* communities in the world. In Egypt the mangrove is surviving at the very edge of its ecological requirements. Mangrove or “Shoora” plant grows on the shore, but often invading the sea on muddy flats of shallow water. The complex web of life, which is built around the mangrove tree, is unique and highly susceptible to environmental changes. Besides plethora of marine organisms which are associated with mangroves, several water birds depend on the plant for nesting and feeding microhabitats. Striated Heron *Ardeola striata*, Reef Heron *Egretta gularis*. Spoonbill *Platalea leucorodia* and Osprey *Pandion haliaetus* all have substantial breeding populations in and around the mangrove. A small number of *Gazella dorcas* inhabits the adjacent desert which is rich in vegetation and supports a rich flora. The protected area includes a variety of landscape features and supports a small native population.

Collecting Sites:

1. Ghargana: 28°06'N 34°26'E (Region of Mangrove *Avicennia marina* (Forskål, 1775), and other plants)
2. Zeidiya: 28°08'N 34°26'E
3. Mouth of Wadi Kid – Kherieza: 28°10'N 34°22'E
4. Wadi Kid – Kherieza: 28°10'N 34°21'E
5. North of Wadi Umm-Arak: 28°08'N 34°26'E
6. Mangrove El-Rwaysiya (Al-Shura Al-Munqatiaah): 28°11'N 34°26'E

Dates of collecting: 30,31 March, 1,3 April, 14,15, 18,19 July, 18-20 November 1994 & 17-20 May 1995.

I. Order Araneida

Spiders of eighteen families were collected from the six studied sites. The identification of the collected specimens with their numbers, months of collecting and sites of collection are in Table 2 and the percentage of specimens of every spider family is plotted in Fig. 2.

Table 2: Spiders collected from Nabq protectorate (March 1994–May 1995).

Family	Species	Specimens	Sites	Month
Agelenidae	<i>Benoitia</i> sp.	2s♂, 2j	4	May, Jul
Araneidae	<i>Argiope lobata</i>	1♀	4	Jul
	<i>Cyrtophora citricola</i>	2♂, 8♀, 1s♀, 3j	2,4,5,6	Mar, May, Jul, Nov
	? sp.	7♀, 2j	6	Jul
Dictynidae	? sp.	1♂, 6♀, 4j	1,3,4,5	Mar-May, Jul, Nov
Eresidae	<i>Stegodyphus lineatus</i>	2♀, 11j	4	May, Jul, Nov
Filistatidae	? sp.	1j	4	Nov
Gnaphosidae	<i>Micaria ignea</i> ?	1♂, 4♀, 5j	3,4	Mar-May
	<i>Pterotricha dalmasi</i>	4♂, 1♀, 1s♀, 14j	2,3,4,5	Mar-May, Jul, Nov
	<i>Zelotes</i> sp.	1j	4	May

	? sp. (2 spp.)	1♂, 1s♂, 9j	3,4,5	Apr, May, Jul, Nov
Lycosidae	? sp.	1♀	4	Nov
Miturgidae	<i>Cheiracanthium</i> sp.	1s♂	5	Jul
Oecobiidae	<i>Uroctea limbata</i> ?	2♀, 3s♀	3	Mar, Apr
Oxyopidae	<i>Oxyopes</i> sp. <i>Peucetia arabica</i>	1j 5♂, 8♀, 19j	4 3,4	May Mar-May, Jul, Nov
Philodromidae	<i>Philodromus</i> sp. <i>Thanatus</i> sp.	3♂, 6♀, 1s♂, 1s♀, 51 j 2♀	2,4,5 3	Mar, May, Jul, Nov Apr
Pholcidae	<i>Holocnemus pluchei</i> ? sp.	1♀ 1j	3 4	Apr Nov
Salticidae	<i>Mogrus fulvovittatus</i> <i>Myrmarachne tristis</i> <i>Thyene imperialis</i> ? sp. (~4 spp.)	3♂, 1♀, 1s♂, 1s♀, 4j 2♂, 1♀, 1s♀, 5j 1♂ 3♀, 1s♀, 21j	3,4,5 2,4,5 2 3,4,5	Apr, May, Jul May, Jul, Nov Mar Apr, May, Jul, Nov
Scytodidae	<i>Scytodes</i> sp.	1♂	4	Nov
Sparassidae	<i>Eusparassus</i> sp.	3j	3,4	Mar, Nov
Tetragnathidae	<i>Tetragnatha</i> sp.	1s♀	6	Jul
Theridiidae	<i>Latrodectus pallidus</i>	1♂	4	Nov
	<i>L. tredecimguttatus</i> <i>Paidiscura dromedaria</i> ? sp. (2 spp.)	1♀ 4♂, 9♀, 2s♂, 61j 1♂, 5♀, 1s♂, 1s♀, 3j	4 2,4,5 3,5	May Mar, May, Nov Apr, Jul, Nov
Thomisidae	<i>Synema diana</i> <i>Thomisus onustus</i> <i>Xysticus fesus</i> ?	5♂, 1s♀, 27j 4♂, 5♀, 1s♀, 7j 1♀	1,4,5 2,3,4,5 4	Mar, May, Jul, Nov Mar-May, Jul Nov

Most spiders were found under stones. The other habitats and observations on some spider taxa, arranged alphabetically according to families, are as follows :

AGELENIDAE: *Benoitia* sp. juveniles were found in nests attached to their peculiar funnel webs among plants in Site 4.

ARANEIDAE: *Argiope lobata*: 1♀ on her orb web, Site 4, on July. *Cyrtophora citricola*: adults and juveniles were found on their webs in Sites 2,4,5,6; some of them on *Nitraria* trees and terrestrial parts of *Avicennia marina* (Mangrove plants).

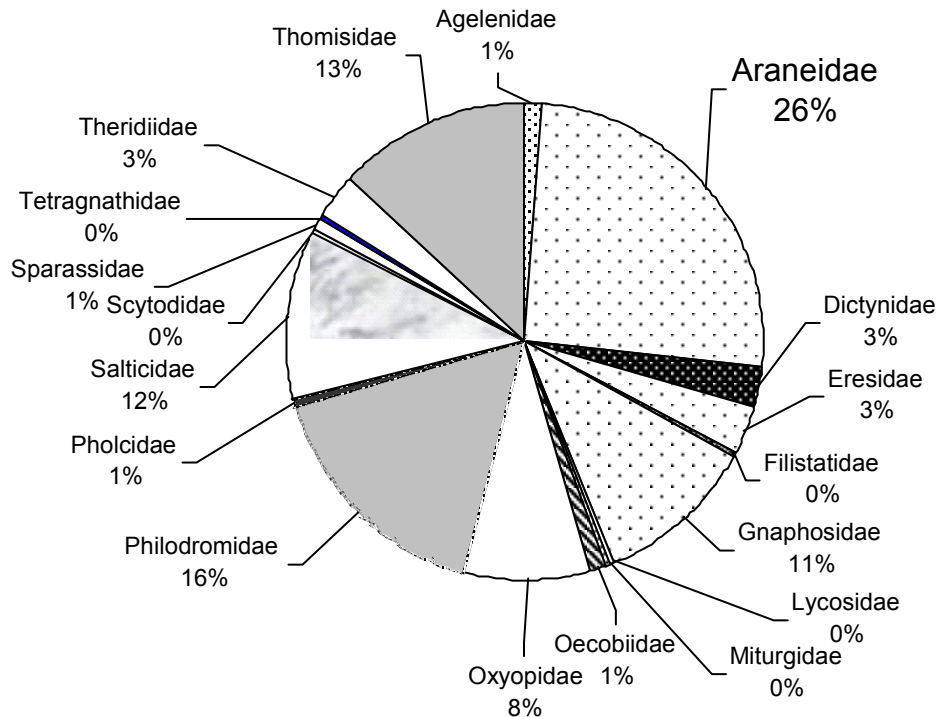
DICTYNIDAE: 1♀ on Mangrove plant, Site 1. Others in their webs on plants and under stones in Sites 3,4,5.

ERESIDAE: *Stegodyphus lineatus*: females and juveniles were found inside their nests on plants in Site 4, on May, July and November. (Adult females only on November.)

GNAPHOSIDAE: *Micaria ignea* ?: adults and juveniles were found under stones near colonies of ants in Sites 3,4, on March, April and May. *Pterotricha dalmasi*: adults and juveniles were sometimes found running among stones and mangrove's litter in Sites 2,3,4,5, on March, April, May, July and November.

LYCOSIDAE: 1♀ was found with her egg sac in Site 4, on November.

Fig. 2. Percentage of specimens of every spider family collected from Nabq Protectorate.



OXYOPIIDAE: *Peucetia arabica*: on *Zygophyllum* and other plants, and once inside a wooden building, Sites 3,4.

PHILODROMIDAE: *Philodromus* sp.: 1♀ on Mangrove in Site 2 and on other plants in Sites 4,5. *Thanatus* ? 2♀ under stones in Site 3, on April.

PHOLCIDAE: *Holocnemus pluchei*: 1♀ with her egg mass, inside a wooden building in Site 3, on April.

Mogrus fulvovittatus: on plants and wanderers in Sites 3,4,5. *Myrmarachne tristis*: adults and juveniles on *Nitraria* trees and other plants in Sites 2,4,5, on May, July and November. *Thyene imperialis*: 1♂ on Mangrove plant in Site 2, on March.

TETRAGNATHIDAE: *Tetragnatha* sp.: 1 s♀ on her web on Mangrove plants in Site 6.

THERIDIIDAE: two species of genus *Latrodectus* were found in Site 4. A juvenile individual at the entrance of an empty small stony cave on November. It was reared until reaching maturity to be a male *Latrodectus pallidus*. The other specimen was adult female of *L. tredecimguttatus* inside her nest among plants on May. *Paidiscura dromedaria*: adults and juveniles on *Nitraria* trees and other plants in Sites 2,4,5, on March, May and November. This species was mostly collected by beating net method.

THOMISIDAE: *Synema diana*: on Mangrove and other plants in Sites 1,4,5. *Thomisus onustus*: on *Zygophyllum* and other plants in Sites 2,3,4,5.

II. Order Pseudoscorpionida

Six specimens, 2♂ + 4♀, of Family Olpiidae, *Minniza* cf. *hirsti* J.C. Chamberlin, 1930, were found under stones in Sites 3 and 4 (Wadi Kid) on April, May and November. Two females of Family Cheliferidae ? were found on *Nitraria* trees in Site 5 (North of Wadi Umm-Arak) on July and November.

III. Order Scorpionida

Three species of the same family of scorpions, Family Buthidae, were found under stones in Sites 3 and 4.

1. One *Compsobuthus wernerii* (Birula, 1908) in Site 3, on March.
2. Two *Leiurus quinquestriatus* (Ehrenberg, 1828) in Site 3, on April and a third specimen in Site 4, on November.
3. Three *Orthochirus innesi* Simon, 1910 in Site 4, on May.

IV. Order Solpugida

Four males and three juveniles (?) of Family Daesiidae, *Biton ehrenbergi* Karsch, 1880, were attracted at night to artificial light and captured in Site 4, on May.

C. Abu Galoum protectorate

Abu Galoum was declared as protected area by the Prime Ministerial Decree No. 1511 for 1992. Its area is about 500 km². Type: Landscape Protected Area.

The high basement complex coastal mountains well represented in this protected area contain many faunal and floral components characteristic of the hinterland of South Sinai. There are 44 endemic species among 165 plant species recorded from the protectorate. Nubian Ibex *Capra nubiana* is a prominent mammal species. Intact coral reefs fringe the coast in this section of the Gulf of Aqaba. The protected area plays an important role in regulating the land use along the Gulf of Aqaba coast, acts as a buffer zone between different development focal points along that coast, and protects the natural resources within the area which form the back bone of the region's economy.

Collecting Sites:

1. Mouth of Wadi Misk Al-'Abd, on gulf: 28°45'N 34°37'E
2. Mouth of Wadi Umm Afaii, on gulf: 28°43'N 34°37'E
3. Mouth of Wadi Rasasah, on gulf: 28°39'N 34°34'E
4. Wadi Hibiq, 9km north of Wadi Abu-Nafrah: 28°51'N 34°34'E
5. Wadi 'Amoud, near Jabal Mukaymin: 28°42'N 34°34'E
6. Wadi Rasasah: 28°40'N 34°34'E
7. Al-'Umayyid: 28°37'N 34°33'E
8. End of Wadi Abu-Nafrah, west of Jabal Sukhn: 28°45'N 34°34'E

Dates of collecting: 15-17 July, 15-17 November 1994 & 18-19 May 1995.

I. Order Araneida

Spiders of sixteen families were collected from the eight studied sites. The identification of the collected specimens with their numbers, months of collecting and sites of collection are included in Table 3 and the percentage of specimens of every spider family is plotted in Fig. 3.

Table 3: Spiders collected from Abu Galoum protectorate (July 1994–May 1995).

Family	Species	Specimens	Sites	Months
Agelenidae	<i>Benoitia lepida</i>	1♂, 1♀, 3s♂, 23j	4	May, Jul
Araneidae	<i>Argiope</i> sp. <i>Cyrtophora citricola</i>	1j 1♂, 1♀, 1s♂, 1s♀, 4j	4 1,3,4,5	May May, Jul, Nov
Eresidae	<i>Stegodyphus dufouri</i> <i>Stegodyphus</i> sp.	4♀ 1j	1 4	May Jul
Filistatidae	? sp.	1j	2	Nov
Gnaphosidae	<i>Pterotricha</i> sp. <i>Zelotes</i> sp. ? sp. (~2 spp.)	7j 1♂, 1j 1♀, 13j	3,4,5 2,8 2,3,4,8	May, Jul Jul, Nov May, Jul, Nov
Linyphiidae	? sp.	1j	7	Jul
Lycosidae	? sp.	1♂, 13j	2,4,5,7,8	May, Jul, Nov
Miturgidae	<i>Cheiracanthium</i> sp.	1j	5	May
Oecobiidae	<i>Oecobius templi</i> ? <i>Uroctea limbata</i>	1♀, 1s♂, 1s♀, 4j 1♂, 6j	4,5,6,8 3,4,5,7	May, Jul May, Jul, Nov
Oxyopidae	<i>Peucetia arabica</i>	1♂, 1♀, 1s♂, 8j	3,4,5	May, Jul, Nov
Philodromidae	<i>Philodromus</i> sp.	1s♂, 1♀, 11j	1,2,3,4,6,7	May, Jul, Nov
Salticidae	<i>Mogrus</i> sp. <i>Plexippus paykulli</i> ? sp. (~4 spp.)	1j 1♂ 4♂, 1♀, 23j	2 3 1,2,3,4,5,6,7	Jul May May, Jul, Nov
Sicariidae	<i>Loxosceles</i> sp.	1j	4	Nov
Theridiidae	? sp. (2 spp.)	2♀, 4j	1,4,5,7	May, Jul, Nov
Thomisidae	<i>Thomisus onustus</i> <i>Xysticus ferus</i> ?	1♂, 1♀, 1s♀, 11j 1♀, 1s♂, 1s♀, 4j	1,3,4,5,6,7 2,3,4,5,7	Jul, Nov May, Jul, Nov
Zodariidae	<i>Zodarion</i> sp.	1♀	3	May

Most spiders were found under stones. The other habitats and observations on some spider taxa, arranged alphabetically according to families, are as follows :

AGELENIDAE: *Benoitia lepida*: adults and juveniles were found on their peculiar funnel webs among plants in Site 4, on May and July.

ARANEIDAE: *Argiope* sp.: on its orb web, Site 4, on May. *Cyrtophora citricola*: adults and juveniles were found on their webs among plants in Sites 1,3,4,5.

ERESIDAE: *Stegodyphus dufouri*: 4♀ were found inside their nests on a wooden building in Site 1, on May.

OXYOPIAE: *Peucetia arabica*: on plants in Sites 3,4,5.

PHILODROMIDAE: *Philodromus* sp.: on plants in Sites 1,2,3,4,6,7.

SALTICIDAE: *Mogrus* sp.: on plants in Site 2. *Plexippus paykulli*: 1♂ inside a wooden building in Site 3.

THOMISIDAE: *Thomisus onustus*: on plants in Sites 1,3,4,5,6,7.

ZODARIIDAE: *Zodarion* sp.: 1 ♀ was attracted at night to light in Site 3, on May.

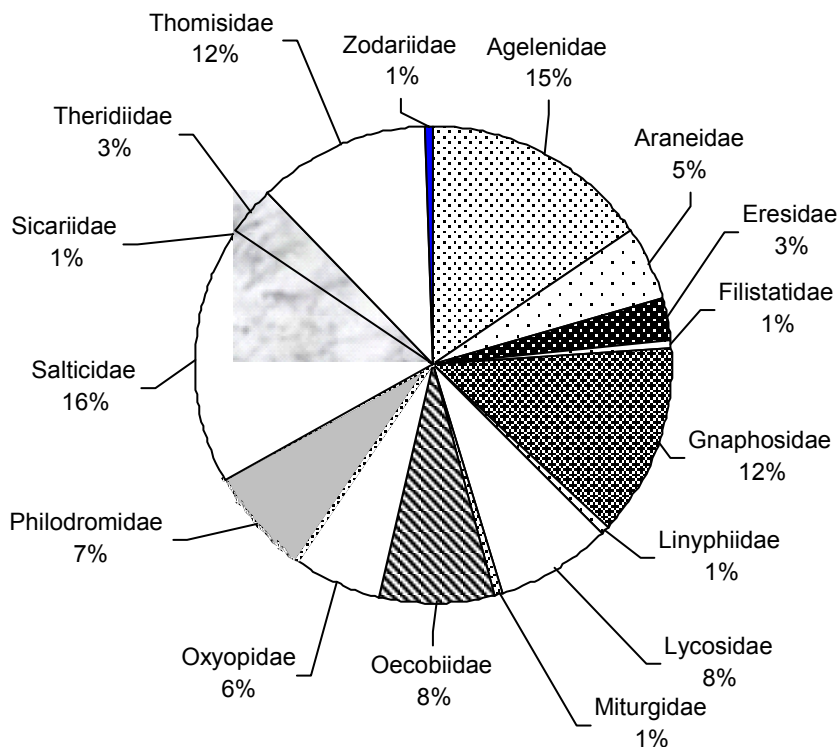


Fig. 3. Percentage of specimens of every spider family collected from Abu Galoum Protectorate.

II. Order Pseudoscorpionida

Nine pseudoscorpions of two families were found in sites 3 (Mouth of Wadi Rasasah) and 5 (Wadi `Amoud, near Jabal Mukaymin). Two males of Family Cheliferidae, *Rhacochelifer* sp., were found on *Acacia* trees in site 5 on May and November. The other seven specimens, 3♂ + 4♀, belong to Family Olpiidae, *Minniza* cf. *hirsti* J.C. Chamberlin, 1930; two of them were found in site 3 and five in site 5. All *Minniza* specimens were found under stones on November.

III. Order Scorpionida

Only one species of scorpions, *Leiurus quinquestriatus* (Ehrenberg, 1828), Family Buthidae, was found twice on July; in site 3 using Ultra Violet radiation and in site 8 (End of Wadi Abu-Nafrah, west of Jabal Sukhn) under a stone.

IV. Order Solpugida

Six juvenile solpugids of Family Daesiidae were found in sites 3 and 5. Two of genus *Blossiola* ? were attracted at night to light in site 3 on May and two others of the same genus were found under stones in site 5 on July. On November, a *Biton* sp. and a *Blossiola* ? sp. were found in site 3 under stones.

Alphabetical list of identified spider species

<i>Argiope lobata</i> (Pallas, 1772)	<i>Peucetia arabica</i> Simon, 1882
<i>Benoitia lepida</i> (O.P.-Cambridge, 1876)	<i>Philodromus sinaiticus</i> Levy, 1977
<i>Cyrtophora citricola</i> (Forskål, 1775)	<i>Plexippus paykulli</i> (Audouin, 1825)
<i>Heriaeus buffoni</i> (Audouin, 1825)	<i>Pterotricha conspersa</i> (O.P.-Cambridge, 1872)
<i>Holcnemus pluchei</i> (Scopoli, 1763)	<i>Pterotricha dalmasi</i> Fage, 1929
<i>Latrodectus pallidus</i> O.P.-Cambridge, 1872	<i>Stegodyphus dufouri</i> (Audouin, 1825)
<i>Latrodectus tredecimguttatus</i> (Rossi, 1790)	<i>Stegodyphus lineatus</i> (Latreille, 1817)
<i>Micaria ignea</i> O.P.-Cambridge, 1872	<i>Synema diana</i> (Audouin, 1825)
<i>Mogrus fulvovittatus</i> Simon, 1882	<i>Thomisus onustus</i> Walckenaer, 1805
<i>Mogrus sinaicus</i> Prószyński, 2000	<i>Thyene imperialis</i> (Rossi, 1846)
<i>Myrmarachne tristis</i> (Simon, 1882)	<i>Uroctea limbata</i> (C.L.Koch, 1843)
<i>Oecobius templi</i> O.P.-Cambridge, 1876	<i>Xysticus ferus</i> (O.P.-Cambridge, 1872)
<i>Paidiscura dromedaria</i> (Simon, 1880)	

Discussion

Spiders, pseudoscorpions, scorpions and sun-spiders were studied for the first time in coastal protected areas of Egypt. All species, with few exceptions, were recorded for the first time from those areas (El-Hennawy, 1988, 1992, 1998, 2002a, 2002b and 2002c). This preliminary study led to the following notes:

1. Family Eresidae: *Stegodyphus dufouri* may be transferred with human beings. This species is widely distributed in the Nile Valley. It was found in Abu Galoum near a police camp.
2. Family Gnaphosidae: *Pterotricha conspersa* was recorded from Ras Mohammad while *P. dalmasi* was its counterpart in Nabq. The two species were widely distributed as well as their presence among Mangrove's litter.
3. Family Oecobiidae: *Uroctea limbata* was recorded from the three protected areas. It may be a variety or almost a subspecies of this palaearctic species.
4. Family Oxyopidae: *Peucetia arabica* is widely distributed on different kinds of plants in the three protected areas.
5. Family Salticidae: *Mogrus fulvovittatus* was recorded from Nabq, while *Mogrus sinaicus* was found in Ras Mohammad. The last species needs a study of more specimens, especially males, to be sure that it is a valid species and not a synonym to *M. fulvovittatus*. The epigynum of *M. sinaicus* is "closely resembling that of *M. fulvovittatus*" as its author himself stated (Prószyński, 2000), while the male of this species is still unknown.
6. Family Theridiidae: Two species of genus *Latrodectus* were recorded from Wadi Kid, Nabq protectorate. *L. pallidus* lives inside stony caves while *L. tredecimguttatus* lives among plants. Levy (1998) recorded *L. pallidus* from Sinai, but "there are no explicit records". He also recorded *L. tredecimguttatus* from the middle and south of Sinai without definite locality.
7. Family Thomisidae: *Xysticus ferus* ? female specimens are something similar to *Xysticus tristrami* (O.P.-Cambridge, 1872). The discovery of the male of this species may lead to a synonymy between the two species.
8. The pseudoscorpions of genus *Rhacochelifer*, Family Cheliferidae, are very similar to *R. similis* Beier, 1932 which was recorded from Libya and Siwa Oasis in western

desert of Egypt (Beier, 1932 & 1947). The confirmation of their identification needs more specimens.

This study leads us to state that it is necessary to make continuous seasonal survey of all arachnid species in the coastal protected areas of Egypt to elucidate their importance in their environment. A thing which enables the monitoring of these species in relation to the environmental changes which affect them in these areas.

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